

Genetic and phenotypic correlations between triacylglycerol fatty acids at weaning and slaughter in beef cattle

A.E.O. Malau-Aduli*, B.D. Siebert, C.D.K. Bottema and W.S. Pitchford.

Dept. Animal Science, University of Adelaide, Glen Osmond, SA 5064 Australia.

Predicting fatty acid composition of beef cattle at slaughter using weaner data would enable an early selection decision thereby saving time and costs associated with progeny testing. The aim of this study was to examine genetic and phenotypic correlations between triacylglycerol fatty acid composition at weaning and slaughter. Subcutaneous fat between the 12th and 13th rib interface was biopsied from 324 weaner calves sired by Angus, Belgian Blue, Hereford, Jersey, Limousin, South Devon and Wagyu. Fat from the same anatomical site was sampled from their carcasses at slaughter and analysed for fatty acids by gas-liquid chromatography. Statistical analysis was by Mixed Model and Maximum Likelihood Procedures of Harvey (1990) after adjusting for genotype, sire nested within genotype, sex and location. Results indicated strongly positive genetic correlations between biopsy and carcass stearate (18:0), oleate (18:1n-9), total monounsaturated fatty acids (MUFA) and Δ^9 -desaturase enzyme index of 0.84, 0.99, 0.93 and 0.82 respectively. However, biopsy and carcass palmitate (16:0) had a low genetic correlation of 0.15. Phenotypic correlations were relatively low and ranged from 0 to 0.67. The highly significant genetic correlations obtained suggest that selection decisions for fatty acid composition in the adipose tissue of cattle could be made at weaning.